

REMARKS

Claims 1-3, 5-7, 9-16, 19-67, 69 and 70 were previously pending in the application and have been rejected. After entry of the amendment, claims 34-67, 69 and 70 are pending.

AMENDMENTS

Claims 34 and 50 have been amended clarify that the carcass is identified as a dark-cutting bovine carcass by evaluating grading pH and color. Support for this amendment is located at paragraph [004] of the specification as filed.

Claims 1-3, 5-7, 9-16, 19-33 have been canceled without prejudice to expedite prosecution of this application.

INTERVIEW

Examiners Stulii and Weinstein are thanked for courtesies extended in granting an interview in the above application, which interview was held on February 22, 2010. In the interview, the teachings of the prior art references in view of both timing of application (pre- or post- rigor) of the compositions, and the nature of the compositions (acidic or basic) were discussed to show why the skilled artisan would not have combined these references. Arguments presented at the interview are repeated and expanded upon below.

CLAIM REJECTIONS 35 USC § 103

Claims 1-3, 5, 6, 9-25, 27, 34-39, 40-43, 50-52, 53-57 and 67-70 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Calkins et al. (U.S. Patent Application Publication No. 2002/0054941, pages 1-5) in view of Paterson et al. (U.S. Patent Application Publication No. 2003/0180439).

As discussed in the background section of the present application, carcasses presenting muscles that are dark in appearance are commonly referred to in the art as "dark-cutting," "dark-cutters," or "dark, firm, and dry (DFD)." Dark-cutting carcasses yield meat that commands a substantially lower price than meat from non-dark-cutting

carcasses because consumers identify the appearance of muscles from dark-cutting carcasses as unappealing and unwholesome, even though palatability characteristics and wholesomeness of meat from dark cutting carcasses is not different from meat derived from carcasses presenting a normal red color.

The present application explains that dark-cutting meat occurs as a result of stressors on the animal, such as management practices, weather, feeding, illness or transportation, that result in depleted muscle glycogen levels before slaughter. When such stress occurs, muscles lack the glycogen quantities necessary to reduce the pH of muscles to normal postmortem levels (pH -5.5 to 5.8) and have high final pH's (>6.2).

The present claims are drawn to a method for treating meat from a dark-cutting carcass, comprising: identifying meat in a dark-cutting carcass by evaluating grading pH and color, and after onset of rigor mortis contacting said meat derived from said dark-cutting carcass with an amount of at least one pH-lowering agent, wherein the meat has a grading pH and grading color, and the amount of pH-lowering agent is sufficient to lower the pH and to lighten the color from the grading color of at least a portion of said meat.

Thus, the present invention operates to rehabilitate dark cutter meats. Dark cutter meats can result when an animal is under stress, so that the meat has a higher pH at time of rigor mortis. See paragraph [0002] of the present published application. By definition, meat is always graded after onset of rigor mortis. See paragraph [0021] of the present published application. In the presently claimed invention, a pH lowering agent is added after the onset of rigor mortis to lower the pH and lighten the color of the meat.

Calkins et al. describe treatment of a pre-rigor meat with citric acid or a salt thereof to enhance tenderness of the meat. As acknowledged in the Office Action, Calkins et al. do not disclose treatment after onset of rigor mortis. Instead, Calkins operates under their understanding that meat having a final pH that is high is more tender than meat having a final pH that is low. See paragraph [0009]. Their ultimate object therefore is to reduce the drop in pH by pre-rigor addition of acid. This effectively maintains a higher final pH in the meat. See paragraph [0063]. In modifying the pH, Calkins is balancing the desired tenderness against the possibility of preparing dark meat. See the experimental result discussed at paragraph [0131].

Indeed, Calkins et al. repeatedly emphasizes the need to apply the citric acid or salt thereof to the meat pre-rigor. See paragraphs [0002], [0005], [0006], [0007], [0008], [0013], [0020], [0021], [0023], [0047], [0067], independent claims 1, 15 and 29, and the Abstract. Paragraph [0005] in particular identifies the importance of the difference between pre-rigor treatment and post-rigor treatment, and paragraph [0011] notes the differences in the pattern of postmortem glycolysis relative to the onset of rigor. Thus, the teaching of Calkins et al. inescapably asserts that pre-rigor application of citric acid or a salt thereof is essential to the operation of the invention described therein, and that post-rigor application of a pH-lowering agent to a meat as required in the present claims is not to be considered.

The Calkins et al. disclosure further precludes operation of an essential element of the present claims, which recite that the pH-lowering agent is applied to lower the pH of at least a portion of said meat below its pH level at grading and to lighten the color from the grading color. By definition, the grading pH is determined after rigor mortis. Because the treatment composition of Calkins et al. is applied before rigor mortis, the composition is applied before the grading pH can even be determined. Thus, it is not possible for Calkins et al. to lighten the color from the grading color, since the grading color never is established before application of the Calkins et al. composition.

Patterson et al. operate under a belief that if there is a rapid fall in pH, meat is acidic and has low quality. See paragraph [0005]. To solve this problem, they add a pH increasing component like sodium bicarbonate, either before or after rigor mortis.

Patterson et al. is cited for the purpose of showing that application of a pH increasing agent to meat to elevate the pH of the meat may be carried out either before or after rigor mortis.

It is respectfully submitted that the skilled artisan would have had strong disincentives to combine Calkins et al. with Paterson et al. in the treatment of dark cutting meat as proposed in the Office Action. First, as noted above, Calkins et al. repeatedly emphasizes the need to apply the citric acid or salt thereof to the meat pre-rigor. To act against this express instruction of the reference is manifestly improper.

Due to the very direct teaching of Calkins et al., this skilled artisan would have had no reason to change the time of application of a treatment composition from the teaching of Paterson et al. This is particularly the case since both Calkins and Patterson seek to provide a meat product having a higher pH in the end product. They accomplish this objective in opposite ways, wherein Calkins attempts to pre-empt the pH drop by adding pH lowering agent before rigor, and Patterson attempts to increase pH in a straightforward manner by simply adding pH increasing ingredient either before or after rigor. The last thing either reference would suggest is to add a pH lowering agent post-rigor. Thus, combination of these references in the manner proposed in the outstanding Rejection is not proper because the combination is contrary to the teaching of Calkins et al.

Second, one would have expected from the Paterson et al. disclosure that adding a pH lowering agent to post-rigor meat would reduce the quality of the meat product. Paterson teaches at paragraph [0005] that “a low pH at the end of 24 hours post-mortem results in acidic conditions which give rise to lower quality meat.” Following this separate direct teaching from Paterson et al., the skilled artisan would not have carried out a process that would result in a low pH in the meat product as required in the present claims. Thus, combination of these references is not proper because the combination is contrary to the teaching of Paterson et al.

Because of the strong teaching in both references against post-rigor treatment of meat with a pH lowering composition, it is respectfully submitted that the skilled artisan would consider the combined teaching of these references to at most support the pre-rigor treatment of meat with a pH lowering composition, and to further reinforce the concept that post-rigor meat should not be treated with a pH lowering composition.

Additionally, Calkins et al. provides description that shows that the difference in timing of treatment of the meat in Calkins et al. results in generation of a product that is actually different from the product presently claimed. Calkins et al. disclose at paragraph [0009] that it is their strategy “to increase pH while preserving desirable color” (emphasis added). The timing of the administration of the acid in Calkins et al. was stated to reduce the pH decline normally observed in meat. This provides a final product meat that has a higher final pH as compared to a control wherein acid was not administered. See

paragraphs [0063] and [0069]. The result was stated to provide a more tender muscle, "without detriment to lean color." See paragraph [0069]. In fact, the experimental results reported in Calkins et al. show that two of the three muscles were "slightly, but significantly darker than controls." Paragraph [0131], emphasis added. The observed color effect is thus the opposite of what occurs in the present method, which results in a final product that is lighter in color than controls. Therefore, the timing of addition of acid to meat before or after rigor is not merely an equivalent choice of processing order. Rather, the presently claimed final product is surprisingly different in fact from the product disclosed in Calkins et al.

Reconsideration and withdrawal of this rejection is therefore respectfully requested.

Claims 7, 26, 28, 33, 48, 49, 65 and 66 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Calkins et al. in view of Paterson et al. (U.S. Patent Application Publication No. 2003/0180439) and Komarik (U.S. Patent No. 3,526,521, Abstract and cols. 2-3).

Komarik is cited for its teaching regarding the use of GDL and sodium erythorbate in the process of curing whole meats, and it is asserted that the skilled artisan would have used these chemicals in the treatment method of Calkins et al. in view of Paterson et al.

It is respectfully submitted that the combination of these references does not render the present claims obvious. Specifically, the rejected claims are drawn to a method for treating meat from a dark-cutting carcass by contacting the meat with at least one pH-lowering agent sufficient to lower the pH and to lighten the color from the grading color of at least a portion of said meat.

As noted above, the object of Calkins is to treat pre-rigor meat to enhance tenderness of the meat, and Calkins does not contemplate treatment of post-rigor or dark dark-cutting carcasses at all. The skilled artisan would have had a strong disincentive to change the Calkins treatment to a post-rigor treatment of dark cutting meat in view of the teaching that the pH of dark cutting meat is already too low. Also as noted above, the

skilled artisan would have had strong disincentives to combine Calkins et al. with Paterson et al. in the treatment of dark cutting meat as proposed in the Office Action. Even if combined, the references would have taught the skilled artisan to treat pre-rigor meat with a pH lowering composition to achieve the desired object of the primary reference. The last thing either reference would suggest is to add a pH lowering agent post-rigor. When adding the disclosure of Komarik to this teaching, the skilled artisan would have concluded that the specific compositions described in Komarik would properly be applied pre-rigor. The present post-rigor treatment therefore cannot be said to be obvious in view of these references in combination.

Reconsideration and withdrawal of this rejection is therefore respectfully requested.

Claims 29-32 and 45-47 and 62-64 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Calkins et al. in view of Paterson et al. (U.S. Patent Application Publication No. 2003/0180439) and Nakao et al. (U.S. Patent No. 3,666,488, cols. 2-3).

Nakao is cited for its teaching regarding use of phosphate buffers.

More specifically, Nakao teaches stabilizing the meat color developed in meat products by the treatment with nitrates or nitrites by contacting the meat with a weakly acid aqueous solution having a specified pH and acid content. See claim 1. The use of phosphate buffer systems is mentioned at the top of column 3. Nakao therefore provides discussion about stabilizing an existing color, but provides no teaching or suggestion about treating a dark-cutting meat to lighten the color of the meat after it has been graded.

Even if the chemical selections of Nakao were used in the process of Calkins as asserted in the Office Action, such a combination would not result in a method as presently claimed. As noted above, the object of Calkins is to treat pre-rigor meat to enhance tenderness of the meat, and Calkins does not contemplate treatment of post-rigor or dark-cutting carcasses at all. Also as noted above, the skilled artisan would have had strong disincentives to combine Calkins et al. with Paterson et al. in the treatment of dark cutting meat as proposed in the Office Action. Even if combined, the references would

have taught the skilled artisan to treat pre-rigor meat with a pH lowering composition to achieve the desired object of the primary reference. The last thing either reference would suggest is to add a pH lowering agent post-rigor. The present post-rigor treatment therefore cannot be said to be obvious in view of these references in combination.

Reconsideration and withdrawal of this rejection is therefore respectfully requested.

Claims 44 and 61 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Calkins et al. in view of Paterson et al. (U.S. Patent Application Publication No. 2003/0180439) and Tracy et al. (U.S. Patent No. 4,576,825, cols. 2-3) or Holdren et al. (U.S. Patent No. 5,736,186, col. 6).

Tracy and Holdren are cited in the above rejection for their teaching of use of encapsulated materials in curing meats. It is noted that these references provide no teaching or suggestion about treating a dark-cutting meat to lighten the color of the meat after it has been graded.

Even if the chemical selections of Tracy and/or Holdren were used in the process of Calkins as asserted in the Office Action, such a combination would not result in a product or method as presently claimed. As noted above, the object of Calkins is to treat pre-rigor meat to enhance tenderness of the meat, and Calkins does not contemplate treatment of post-rigor or dark dark-cutting carcasses at all. Also as noted above, the skilled artisan would have had strong disincentives to combine Calkins et al. with Patterson et al. in the treatment of dark cutting meat as proposed in the Office Action. Thus, even if combined, the references would have taught the skilled artisan a product and a method whereby pre-rigor treatment is required to achieve the desired object of the primary reference. The last thing either reference would suggest is to add a pH lowering agent post-rigor. The present post-rigor treatment therefore cannot be said to be obvious in view of these references in combination.

Reconsideration and withdrawal of this rejection is therefore respectfully requested.

CONCLUSION

In view of the above remarks and amendments, it is respectfully submitted that the foregoing is fully responsive to the outstanding Office Action. Early favorable consideration of the above application is earnestly solicited. In the event that a phone conference between the Examiner and the Applicant's undersigned attorney would help resolve any issues in the application, the Examiner is invited to contact said attorney at (651) 275-9811.

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Respectfully Submitted,

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